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# Major Management Challenges and Program Risks

Department of Energy



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<b>Abstract</b> This report addresses the major performance and accountability challenges facing the Department of Energy (DOE) as it seeks to maintain the nations nuclear weapons capabilities, clean up the contamination resulting from prior nuclear weapons activities, foster a reliable and sustainable energy system, and support continued U.S. leadership in science and technology. It includes a summary of actions that DOE has taken and that under way to address these challenges. It also outlines further actions that GAO believes are needed. This analysis should help the new Congress and administration carry out their responsibilities and improve government for the benefit of the American people.		
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January 2001

The President of the Senate  
The Speaker of the House of Representatives

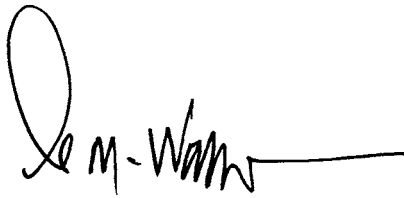
This report addresses the major performance and accountability challenges facing the Department of Energy (DOE) as it seeks to maintain the nation's nuclear weapons capabilities, clean up the contamination resulting from prior nuclear weapons activities, foster a reliable and sustainable energy system, and support continued U.S. leadership in science and technology. It includes a summary of actions that DOE has taken and that under way to address these challenges. It also outlines further actions that GAO believes are needed. This analysis should help the new Congress and administration carry out their responsibilities and improve government for the benefit of the American people.

This report is part of a special series, first issued in January 1999, entitled the *Performance and Accountability Series: Major Management Challenges and Program Risks*. In that series, GAO advised the Congress that it planned to reassess the methodologies and criteria used to determine which federal government operations and functions should be highlighted and which should be designated as "high risk." GAO completed the assessment, considered comments provided on a publicly available exposure draft, and published its guidance document, *Determining Performance and Accountability Challenges and High Risks* (GAO-01-159SP), in November 2000.

This 2001 *Performance and Accountability Series* contains separate reports on 21 agencies—covering

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each cabinet department, most major independent agencies, and the U.S. Postal Service. The series also includes a governmentwide perspective on performance and management challenges across the federal government. As a companion volume to this series, GAO is issuing an update on those government operations and programs that its work identified as “high risk” because of either their greater vulnerabilities to waste, fraud, abuse, and mismanagement or major challenges associated with their economy, efficiency, or effectiveness.

A handwritten signature in black ink, appearing to read "D. M. Walker", followed by a long horizontal line extending to the right.

David M. Walker  
Comptroller General  
of the United States





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# Overview

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The Department of Energy's (DOE) missions are to maintain the nation's nuclear weapons capabilities, clean up the contamination resulting from prior nuclear weapons activities, foster a reliable and sustainable energy system, and promote U.S. leadership in science and technology. DOE also works with the Departments of Defense and State to help prevent the proliferation of nuclear weapons and other weapons of mass destruction. In the post-Cold War environment, securing U.S. nuclear weapons materials and information remains vital to U.S. national interests.

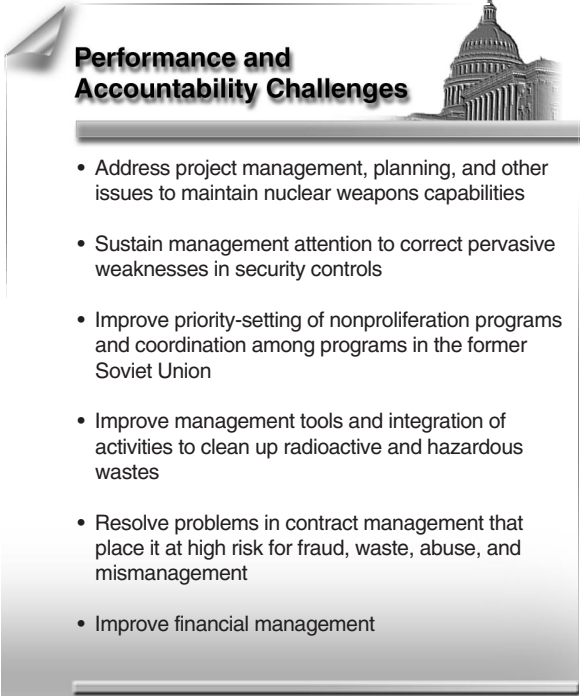
To carry out its missions, DOE has been appropriated about \$17 billion annually in recent years and has almost 16,000 federal employees. The Department has more than 50 major facilities in 35 states. DOE contracts for the management and operation of its major facilities—including its national laboratories, nuclear weapons production facilities, and those facilities undergoing environmental cleanup—and has more than 100,000 prime contractor employees at its facilities. In fiscal year 1999, DOE obligated about \$15.5 billion to contracts.

Over the past several years, GAO, congressional committees, and others have questioned DOE's management practices and effectiveness in carrying out its missions and have made many recommendations for corrective actions. To address long-standing management and security problems at DOE's nuclear facilities, a legislatively mandated reorganization of DOE's defense and national security programs took effect in the spring of 2000.

While DOE has made improvements in its management, the Department continues to face significant performance and accountability challenges as shown in the following inset. The underlying causes of these challenges include problems with DOE's organizational alignment and control, planning, budget formulation and

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execution, human capital, and contract and financial management. Many of the challenges that DOE faces in achieving its goals and objectives are long-standing, and sustained management attention will be needed to correct these weaknesses and implement needed improvements over the long term. DOE's performance in addressing these challenges will significantly influence its ability to efficiently and effectively carry out its defense and national security responsibilities and its environmental cleanup program.



### **Performance and Accountability Challenges**

- Address project management, planning, and other issues to maintain nuclear weapons capabilities
- Sustain management attention to correct pervasive weaknesses in security controls
- Improve priority-setting of nonproliferation programs and coordination among programs in the former Soviet Union
- Improve management tools and integration of activities to clean up radioactive and hazardous wastes
- Resolve problems in contract management that place it at high risk for fraud, waste, abuse, and mismanagement
- Improve financial management

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## **Nuclear Weapons Stockpile**

With the end of the Cold War, a moratorium on nuclear testing was declared, and in its place, DOE created the Stockpile Stewardship Program to develop test facilities

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and computer modeling capability to certify that aging weapons are safe and reliable without exploding them and to ensure the availability of replacement components for weapons. DOE faces management, planning and budgeting, organizational alignment, and human capital challenges as it maintains the nuclear weapons stockpile. DOE's Office of Inspector General recommended in a September 2000 report that DOE develop an overall weapons production infrastructure restoration plan because the deterioration of the infrastructure had, among other things, resulted in delays in the remanufacturing of weapons parts. In our December 2000 report on the Stockpile Stewardship Program, we noted that DOE has made improvements in its planning and budgeting for the program, and we made a number of recommendations to further improve program integration, contract performance criteria, and budget decision-making.

DOE had also made changes to improve its organizational alignment to better define lines of authority but acknowledges that more needs to be done to clarify the roles and responsibilities of headquarters and field staff. Finally, the Stockpile Stewardship Program is faced with a shortage of skilled management and technical staff, and since skilled staff are leaving and the job market is extremely competitive, many believe that staffing shortages will reach crisis proportions by the end of this decade. While DOE is taking actions to address all these challenges, their successful and timely implementation is critical to ensuring an effective and efficient program to maintain aging nuclear weapons.

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**Security Concerns**

DOE's nuclear weapons facilities and the people who work there are potential targets of espionage and other security threats. Numerous studies have identified pervasive weaknesses in DOE's security controls. Our reports have highlighted weaknesses in access to

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computerized information systems, programs for foreign visitors to DOE's national laboratories, and counterespionage measures for foreign travel by DOE's contractor personnel. We have made recommendations for strengthening controls over foreign travel by contractor employees, who are sometimes targets of attempted espionage, and improving the management and oversight of information technology security.

While DOE has responded to many of the recommendations made by others and us and has acted to strengthen its security controls, the Department has not always followed through to ensure that improvements are consistently implemented. For example, while DOE initially expanded the use of background checks for foreign visitors to its national laboratories in response to our 1988 review, it later granted exemptions for two of its laboratories. Consequently, these laboratories conducted background checks on a smaller percentage of their visitors from sensitive countries in 1997 than they had in 1988. With the establishment in March 2000 of the National Nuclear Security Administration, which reorganized DOE's defense and security missions, DOE has a unique opportunity to improve security and effect lasting change. As noted in our April 1999 testimony, DOE's management needs to devote sustained attention to changing DOE's culture, which has not given sufficient priority to security matters.

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**Nonproliferation  
Issues**

DOE conducts several programs to help Russia and other newly independent states of the former Soviet Union control weapons of mass destruction (biological, chemical, and nuclear) and prevent their proliferation. The recent economic and political changes in the newly independent states have left weapons-usable nuclear materials vulnerable to theft or diversion. In addition, weapons scientists facing reduced economic circumstances may be tempted to sell their skills to

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terrorists or countries of proliferation concern. Reducing these risks is a high priority for U.S. national security.

DOE's programs to secure weapons-grade materials and create other jobs for former weapons scientists have been in existence for less than a decade. The Department has improved these programs as it has gained experience and responded to our recommendations for, among other things, ensuring that funding to enhance civilian job opportunities is targeted to those who have been involved in weapons of mass destruction.

Nonetheless, the nonproliferation programs could be made more effective by (1) obtaining better access to facilities and information in the newly independent states to improve priority-setting, (2) verifying the use of program funds, and (3) coordinating the several DOE programs to increase their effectiveness. For instance, if access to facilities and information were improved, DOE's program to install security systems to protect nuclear weapons-grade materials could better target the sensitive Russian facilities that contain over 90 percent of these materials.

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## Environmental Cleanup

DOE has large volumes of radioactive and hazardous wastes and contaminated facilities from 50 years of nuclear weapons research and production activities. Many of the projects to clean up these environmental hazards are inherently complex and may require new technologies and decades of work. Sound management practices are needed to bring such complex projects to completion on time and within budget. Over the past several years, DOE has improved its project planning and management by establishing baselines, which define the scope of work, estimate costs, and specify schedules.

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However, DOE still faces significant management challenges, such as integrating waste treatment, storage, transportation, and disposal activities among its 44 sites with active cleanup work remaining. For example, we have recommended that DOE develop criteria and guidance to increase the cost-effectiveness of decisions regarding options for waste treatment, storage, and disposal. Integrating work among DOE's sites and within its sites that carry out multiple programs could reduce the estimated \$200 billion cost of the cleanup, speed the cleanup of environmental hazards, and reduce the need for duplicate facilities and activities.

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## Contract Management

Contract management also continues to be a significant challenge for DOE. We first designated DOE's contract management as a high-risk area in 1990 and continue to believe that contract management—contract administration and project management—is at high risk for fraud, waste, abuse, and mismanagement. Effective contract management is vital for DOE because the Department relies heavily on contractors to achieve its national security, research, and environmental cleanup missions.

Yet DOE continues to have difficulty in keeping some of its major projects on schedule and within budget. For example, a facility being constructed to evaluate nuclear weapons has a cost overrun of about \$1 billion and a schedule overrun of 6 years. We recommended that DOE arrange for an outside technical review of this project's remaining technical challenges related to its cost and schedule risks. In addition, DOE has utilized contracting strategies that have not accomplished program goals. For example, we concluded that, while fixed-price contracting had been successful for some projects with a known scope, it had generally not accomplished DOE's goals for complex cleanup projects.

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DOE has begun a number of initiatives in contract management and has made progress in this area, but it is too soon to tell whether the initiatives will be effective in the long run. DOE has increased the proportion of major contracts awarded competitively, for instance, from 9 percent of its major contracts in 1990 to 68 percent as of September 2000. However, some of DOE's larger contracts for operating its national laboratories continue to be extended rather than competed. DOE also has initiatives to align performance incentives for contractors more closely with DOE's strategic goals for a site but did not know whether performance-based contracting was improving performance and lowering costs.

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## **Financial Management**

DOE's financial management could be improved. In its February 2000 audit report on DOE's consolidated financial statements for fiscal year 1999, DOE's Office of Inspector General reported a material weakness concerning operational deficiencies in the financial management system for DOE's Western Area Power Administration. Although the Western Area Power Administration developed a corrective action plan for these deficiencies, DOE's Office of Inspector General reported in November 2000 that the power administration was still experiencing delays in preparing its fiscal year 1999 financial information for audit. It also identified a reportable condition concerning estimates of environmental liabilities for contaminated active and surplus facilities. The Office of Inspector General recommended that DOE's Chief Financial Officer develop procedures for verifying data about the facilities, which DOE management agreed to implement.

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# Major Management Challenges and Program Risks: Department of Energy

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DOE's missions are important to providing for national security, U.S. leadership in science and technology, and a reliable, sustainable energy supply. Approximately two-thirds of DOE's budget is devoted to (1) defense and national security programs and (2) environmental cleanup and quality. DOE is responsible for maintaining nuclear weapons by certifying their reliability and replacing their components. In carrying out this mission, DOE must keep nuclear weapons information and materials secure from such threats as espionage and terrorism. DOE's role in preventing the proliferation of nuclear and other weapons of mass destruction is vital in the post-Cold War era. In addition, DOE's mission to produce the nation's nuclear arsenal has left a legacy of environmental hazards needing cleanup; 44 facilities located in 17 states still require active cleanup work.

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## DOE Needs to Address Project Management, Planning, and Other Issues to Effectively and Efficiently Maintain Nuclear Weapons Capabilities

With the end of the Cold War, a moratorium on nuclear testing was declared. As an alternative to such testing, DOE created the Stockpile Stewardship Program to certify that nuclear weapons are safe and reliable. The program poses significant management challenges in ensuring the availability of components vital to the Department's nuclear weapons program; refurbishing or replacing DOE's aging facilities; and building high-cost, state-of-the-art experimental facilities. DOE also faces challenges to improve the following aspects of its Stockpile Stewardship Program: planning and budgeting activities, resolving significant organizational problems and establishing clear lines of authority, and recruiting and training the next generation of weapons scientists and technicians (human capital issues). DOE's successful resolution of these challenges would ensure that the nation continues to have a strong and efficient nuclear weapons program.



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## **Management Challenges**

As part of its Stockpile Stewardship Program, DOE must ensure that the nuclear weapons production infrastructure is adequately maintained, that certain weapon components are available when needed, and that surveillance testing of nuclear weapons components is carried out. DOE must also ensure that experimental state-of-the-art testing facilities are built on time and within budget. However, inadequate maintenance planning and investment have led to the infrastructure's deterioration. Furthermore, inadequate management and ineffective DOE oversight of contractors have increased the costs and extended the schedules for a major construction project. As a result, meeting the goals of the Stockpile Stewardship Program may be difficult for DOE.

DOE's Office of Inspector General reported in September 2000 that the current and future goals of the Stockpile Stewardship Program are at risk because the nuclear weapons production infrastructure had not been adequately maintained.<sup>1</sup> The report noted that although existing data suggested that current military requirements were being met, the deterioration of the infrastructure had resulted in, among other things, delays in the remanufacturing of weapons parts and in the surveillance testing of nuclear weapons components. For example, DOE had planned to produce up to 50 pits (triggers that detonate nuclear weapons) annually to support testing and future stockpile requirements but has not yet reached this goal.

Our work in this area noted that to help manage the effort to develop pit-remanufacturing capability, DOE needs to establish an integrated cost and schedule control system that would allow managers to measure

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<sup>1</sup>See *Management of the Nuclear Weapons Production Infrastructure*, Department of Energy (DOE/IG-0484, Sept. 22, 2000).

costs against the stages of completion and to take corrective actions when variances occur. DOE does not expect to develop such a system until early in 2001, when it will have established a new baseline for the program.

With respect to surveillance testing, the Inspector General's report noted that the surveillance tests that would determine if the reservoirs that hold tritium gas in a weapon have potential problems are 3 to 5 years behind schedule. To ensure that DOE's aging infrastructure is adequately addressed, the report recommended that DOE develop an overall infrastructure restoration plan that would provide (1) a documented rationale for future maintenance funding requests and (2) the basis to monitor performance and ensure accountability for funding decisions. In response, DOE's Office of Defense Programs stated that an ongoing study of facilities and infrastructure would address this recommendation and result in a program plan for improving the infrastructure over the next 10 years.

Contractor management and DOE oversight failures led to major cost overruns and schedule delays in the construction of a new state-of-the-art testing facility—the National Ignition Facility. The facility will be a stadium-sized laser facility that may, for the first time, simulate in a laboratory the thermonuclear conditions created in nuclear explosions. Our August 2000 report noted that DOE estimates that this almost \$3.5 billion facility will not be completed until 2008—more than \$1 billion and 6 years later than originally estimated. Unresolved technical problems, such as the ability to develop optical components that can withstand high-intensity laser beams, may further drive up the cost. While DOE and the contractor have made changes to improve the project's overall management, it is too soon to determine if their implementation will be successful.

To ensure that the project can meet its goals, our report recommended that DOE arrange for an outside scientific and technical review of the National Ignition Facility's remaining technical challenges related to the project's cost and schedule risks. Moreover, the Congress has passed legislation requiring DOE to certify after March 31, 2001, that the National Ignition Facility project is proceeding on cost and schedule, among other things. The legislation also requires DOE to recommend an appropriate path forward for the project and to conduct a study to analyze alternatives for the project's laser configuration.

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**Planning and  
Budgeting Challenges**

DOE has developed an extensive planning process and recently changed its budgetary process to improve its management of the Stockpile Stewardship Program. With respect to planning, DOE has developed over 70 Stockpile Stewardship plans with varying levels of detail. However, these plans are not complete enough to fully support successful implementation of the Stockpile Stewardship Program. Specifically, DOE is still trying to determine some key requirements for the program, such as validating the quantity of the different weapons systems to be refurbished.

More importantly, DOE has not fully integrated its plans into its system of management controls for the program. For example, our December 2000 report found that milestones and other performance measurement information contained in the plans have not been systematically incorporated into the contracts used to manage the operations of the program's laboratories and production plants. This lack of effective integration essentially prevents the separate components of the program from functioning as a cohesive entity. We recommended that the planning process be fully integrated with management controls, including a recommendation that contractor performance criteria and evaluations reflect the plans' milestones. In

responding to our draft report, DOE's Office of Defense Programs agreed with the need to integrate its planning process with its management controls and stated that it had directed field offices to negotiate contracts that add specific self-assessments addressing planning and execution processes.

DOE recently improved its budgeting for the Stockpile Stewardship Program. Program managers and outside technical experts believe that the new structure holds significant promise because it can help identify the program's fixed and variable costs, which can be a useful tool for improving program cost management. However, DOE has experienced some problems in implementing the new structure. For example, when DOE used the structure to develop the program's proposed budget for fiscal year 2001, the laboratories and production plants did not apply the new budget definitions consistently. DOE subsequently amended its budget request, but the amendment makes it difficult to determine the program's fixed and variable costs, in turn, making it difficult to ascertain the amount of funding that could be saved if an activity is cut.

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**Organizational  
Alignment Challenges**

Over the last several years, internal and external studies of the Stockpile Stewardship Program have noted the confusing; overlapping; and at times, conflicting lines of authority within DOE. In response to these findings, DOE has been reorganized to clarify the chain of command between headquarters, field offices, and contractors. Also, the Congress created the National Nuclear Security Administration (NNSA) as a semiautonomous agency within DOE to manage the Department's stockpile stewardship, naval nuclear reactor, and nuclear nonproliferation programs. Additional organizational changes are expected as NNSA's new leadership begins to address past problems while it implements the new administration.

Despite these reorganizations, problems continue. For example, one of the key problems noted in a major management study 3 years ago that still exists today is that DOE has essentially two headquarters offices for the Stockpile Stewardship Program—one in DOE headquarters and one in the Albuquerque Operations Office. As noted in our December 2000 report, because clearly defined roles and responsibilities are lacking, officials in both offices stated that managers in headquarters and Albuquerque were uncertain about what they were authorized to do.

The problems DOE experienced with its project to develop the National Ignition Facility illustrate what can occur without clear lines of authority. Specifically, our August 2000 report found that DOE did not establish a clear chain of command between its headquarters and field office, thereby diffusing accountability for the project. Laboratory officials said that they considered the project's chain of command confusing and really did not know to whom they should report on a day-to-day basis. Because of this confusion, DOE had difficulty taking active control of the project, missed opportunities to ensure the laboratory's accountability, and did not aggressively act on its suspicions that cost and schedule problems existed with the project.

DOE has since begun to establish a clearer chain of command for the National Ignition Facility project and has aligned the contractors performing Stockpile Stewardship Program work under NNSA. In our December 2000 report on the Stockpile Stewardship Program, we recommended that DOE ensure that its recent field structure reorganization is implemented in a way that ensures clear lines of authority between the Office of Defense Programs and its contractors. In commenting on a draft of this report, the Office of Defense Programs agreed that a need exists to resolve organizational ambiguities and improve the understanding of roles, responsibilities, and

accountabilities between headquarters and field elements.

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## **Human Capital Challenges**

Human capital issues may be the single largest problem challenging the nuclear weapons program. This issue, which we raised in our previous report on DOE's management challenges in January 1999, continues to be a challenge that the Department, along with many other federal agencies, is facing. DOE's human capital problems can be seen as part of a broader pattern of human capital shortcomings that have eroded mission capabilities across the federal government. See our *High-Risk Series: An Update* (GAO-01-263, January 2001) for a discussion of human capital as a newly designated governmentwide high risk area.

Several studies have pointed to DOE's need to deal comprehensively with the challenge of recruiting and training the next generation of technical and managerial staff before it reaches crisis proportions by the end of this decade. The experienced designers and engineers who built the weapons in the stockpile and understand how they work are reaching or past retirement age. DOE is also faced with shortages of technicians skilled in the techniques associated with weapons production, such as the plutonium pit-manufacturing process. The number of qualified personnel who can perform this type of work and have the appropriate security clearances is limited.

While a crisis is looming, the lack of staff with sufficient management and technical skills is resulting in problems now. For example, the impact was evident in DOE's National Ignition Facility project. Neither DOE's headquarters staff nor field managers had the skills to oversee the managerial and technical complexities of this large project, and the field staff did not have technical proficiency in laser operations.

DOE has efforts ongoing in many areas to improve the recruitment of staff, including exempting certain technical specialists from salary ceilings and using the unique research and development aspects of the program to attract potential candidates. Management will need to focus on these efforts to ensure that they are implemented so that new employees can be hired to bolster the expertise needed in existing projects and be trained to capitalize on the knowledge of existing workers before they leave their current positions.

Finally, DOE has suffered from instability in its leadership and management team in the Office of Defense Programs, which is responsible for the Stockpile Stewardship Program. Our December 2000 report noted, for example, that the proportion of offices vacant or with acting managers has increased from 17 percent in 1996 to almost 65 percent in 2000. The high turnover may contribute to the fact that the same problems are enumerated year after year. In addition, the high turnover rate impairs DOE's ability to (1) provide consistent and effective leadership, (2) take decisive action on difficult problems, and (3) identify those who should be held accountable for results.

In commenting on our draft report, DOE's Office of Defense Programs agreed that greater stability is desirable but did not consider the level of turnover abnormally high, given the technical nature of the work and the opportunities available to highly educated and skilled personnel. However, we believe that the increasing level of turnover and the widespread dissatisfaction with the lack of consistent management direction among the federal and contractor officials we interviewed are indicative of serious problems. We recommended that DOE identify the reasons for the high level of management turnover in the program and take actions to provide greater management consistency and stability.

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**DOE Needs  
Sustained  
Management  
Attention to  
Correct Pervasive  
Weaknesses in  
Security Controls**

Over the last few years, reports by independent commissions, congressional committees, and the intelligence community have identified serious and pervasive weaknesses in DOE's lines of defense against the loss of classified information. For instance, in June 1999, a special investigative panel of the President's Foreign Intelligence Advisory Board reported security weaknesses, including loosely controlled programs for thousands of foreign visitors to DOE's national laboratories and inadequate systems for controlling classified documents, which periodically resulted in thousands of documents' being declared lost.<sup>2</sup> We and DOE's Office of Inspector General have also reported in the last 2 years on weaknesses in security controls over contractors' travel to foreign countries, access to information systems, the sale of surplus computer equipment, and classified documents. In addition, widely reported incidents at Los Alamos National Laboratory this past year brought DOE's security concerns to national attention.

While DOE has responded to recommendations to improve security in the past, it has not always followed through to effectively implement promised changes over the long term. With NNSA's establishment in March 2000, DOE has an opportunity to give greater priority to fixing known weaknesses in security. To effectively implement improved security measures, DOE needs to devote sustained management attention to changing its culture to ensure that the corrective actions taken will be implemented throughout the Department and will continue to work in the long term. If these challenges are not resolved, DOE may continue to face periodic incidents that threaten the nation's control over its

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<sup>2</sup>See *Science at Its Best, Security at Its Worst: A Report on Security Problems at the U.S. Department of Energy*, Special Investigative Panel of the President's Foreign Intelligence Advisory Board (June 1999).



nuclear weapons secrets and other sensitive information.

Our work and reviews by DOE's Office of Inspector General have identified weaknesses in DOE's security controls over foreign travel by its contractors and computer information systems and equipment. Controls for foreign travel are significant because, each year, thousands of contractor employees from national laboratories travel overseas to attend conferences, conduct research, or exchange ideas. Because of their work, many of these employees have access to classified information. In June 2000, we reported that, over the course of 5 years, more than 75 incidents of attempted espionage against travelers from four laboratories were reported to DOE. These incidents included attempts to elicit information about nuclear materials, searches of travelers' rooms and luggage, offers of sexual favors, and attempts to access information on travelers' laptop computers.

We reported that DOE concentrated its efforts on travel to sensitive countries—those countries considered a potential risk to national security, such as China and Russia. For instance, DOE and its laboratories required additional review of proposed trips to sensitive countries. In addition, the laboratories typically provided face-to-face pretravel counterintelligence briefings only for travelers to sensitive countries. However, travelers to other countries often confront similar incidents as travelers to sensitive countries. We recommended that DOE establish procedures to ensure that DOE and its laboratories apply their resources to the oversight of travel to nonsensitive countries commensurate with the risks associated with such travel.

Information system security has challenged DOE because some of its computer systems contain both publicly available and sensitive information. Sensitive unclassified information is information that is not classified but requires controls over its use and dissemination.<sup>3</sup> Weak controls in such systems could allow inappropriate public access to such information. In addition, in June 2000, we reported that on four recent occasions, DOE's national laboratories experienced Internet-based attacks that disrupted research activities.

Weaknesses in DOE's computer security that were identified by us or by DOE's Office of Inspector General have included

- poor file protection, password management, and network protection (such as intrusion detection and firewalls) that have provided limited protection against malicious attacks by computer hackers;
- public Internet access to sensitive information about DOE's networks that could facilitate electronic intrusions;
- ineffective oversight by DOE of computer security at its science laboratories; and

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<sup>3</sup>More specifically, examples of sensitive unclassified information held by DOE are Unclassified Controlled Nuclear Information, export-controlled information, proprietary information of private companies, and information that is designated for official use only. As defined by DOE, sensitive information includes information whose disclosure could adversely affect national security or government interests.

- the slow implementation of the requirements in a presidential directive to identify critical assets in need of protection, assess vulnerabilities, and prepare corrective action plans.<sup>4</sup>

We made a number of recommendations in our June 2000 report, including (1) the development and implementation of guidelines for a risk-based approach to information technology security management and (2) the development of a clear management oversight process to monitor and enforce laboratories' compliance with DOE's policy and the effectiveness of controls.

In addition, in two cases identified by the Office of Inspector General, DOE contractors sold excess computer equipment without following appropriate controls.<sup>5</sup> The contractor for DOE's Savannah River Site inappropriately sold computer equipment containing sensitive information because the contractor did not follow regulatory requirements to first clear stored information. The buyer of the equipment had intended to ship it to the People's Republic of China. In the second case, the contractor for Sandia National Laboratory sold a supercomputer that had been used for nuclear weapons research.<sup>6</sup> Contractor staff had not followed procedures for export-controlled property and treated the supercomputer sale as any other piece of excess

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<sup>4</sup>These weaknesses were identified through our work and reviews by DOE's Office of Inspector General, specifically *Unclassified Computer Network Security at Selected Field Sites*, Department of Energy (DOE/IG-0459, Feb. 15, 2000) and *Implementation of Presidential Decision Directive 63, Critical Infrastructure Protection*, Department of Energy (DOE/IG-0483, Sept. 22, 2000).

<sup>5</sup>See *Inspection of Surplus Computer Equipment Management at the Savannah River Site*, Department of Energy (DOE/IG-0472, June 1, 2000) and *Inspection of the Sale of a Paragon Supercomputer by Sandia National Laboratories*, Department of Energy (DOE/IG-0455, Dec. 1999).

property. In both cases, the DOE contractor subsequently repurchased the equipment.

DOE has generally agreed with the recommendations made in these areas over the last several years and has taken actions to improve its security program. For instance, DOE is developing a comprehensive assessment of the foreign intelligence threat to its laboratories and other facilities and has hired additional counterintelligence personnel. DOE has also expanded its analytical capabilities for counterintelligence to identify foreign intelligence threats to information, technology, and personnel to help ensure that the Department's resources are mitigating the threats. In the area of computer security, DOE has issued new requirements for unclassified systems and has required each national laboratory to develop and implement protection plans. DOE plans to review its processes for selling excess property. DOE has also improved its security oversight processes by such actions as requiring its Office of Independent Oversight and Performance Assurance to verify the corrective actions reported by field locations.

While DOE has often agreed to take corrective actions to fix security problems, implementation has not always been successful, and problems have recurred. For example, in 1988, we reported that DOE's nuclear weapons laboratories performed required background checks on only 10 percent of their visitors from sensitive countries. DOE acknowledged these problems and expanded background check requirements. However, a few years later, in 1994, DOE granted partial exemptions from the background check requirement to Los Alamos

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<sup>6</sup>Supercomputers are capable of computing at very high speed. The supercomputer sold by Sandia was considered to be one of the 100 fastest computers in the world.

and Sandia National Laboratories. In 1997, we found that Los Alamos and Sandia conducted background checks on only 5 percent of their visitors from sensitive countries.

DOE's difficulty in making lasting security improvements has been due in part to its culture. According to the panel of the President's Foreign Intelligence Advisory Board, "DOE and its weapons laboratories have a deeply rooted culture of low regard for...security issues" that has frustrated efforts to improve security. For instance, the panel found "bureaucratic insolence" in disputing, delaying, and resisting a presidential directive on security. NNSA's creation allows DOE a unique opportunity to increase the effectiveness of security for nuclear weapons information and nuclear materials. We believe, however, that changing DOE's culture may be difficult. NNSA will, at least initially, be made up of existing DOE and contractor employees. For NNSA to be effective in improving security, it must break out of the culture and mindset that permeates DOE. Sustained management attention will be needed to see that security improvements are effectively and consistently implemented.

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**Achieving  
Nonproliferation  
Goals Requires  
Improved Priority  
Setting and  
Program  
Coordination**

DOE plays a major role in U.S. arms control and nonproliferation policies, goals, and programs. DOE, as well as the Departments of Defense and State, help Russia and other newly independent states to control and eliminate weapons of mass destruction and reduce the risks of their proliferation.<sup>7</sup> The recent economic and political changes in the newly independent states of the former Soviet Union have left weapons-useable nuclear materials vulnerable to theft or diversion. Budget cuts have reduced guard forces and the maintenance of security systems. In addition, workers, including scientists at nuclear and biological weapons

facilities, now face difficult economic circumstances, such as unpaid wages and declines in available housing. These factors increase the potential threats from both outside and inside facilities in the newly independent states. Reducing these risks is a high priority for U.S. national security.

In the former Soviet Union, DOE's nonproliferation programs include securing weapons-grade nuclear materials from theft or diversion and creating other jobs for weapons scientists. DOE's programs take place in the context of agreements concluded between the United States and Russia or other newly independent states. However, while Russia has agreed to work with DOE to improve the security of nuclear materials, it has been reluctant to grant U.S. project teams access to many buildings in its nuclear weapons complex where over 90 percent of the nuclear materials are located. Resolving access challenges is critical to ensuring that the large amounts of nuclear materials in these facilities are protected in a manner consistent with U.S. nonproliferation goals. For some buildings, DOE does not have complete estimates of how much nuclear material will require improved security.

DOE's programs to reduce the risks from weapons of mass destruction have been in existence for less than a decade. As it has gained experience, DOE has taken steps to improve program management, such as strengthening internal controls over the use of funding. Nonetheless, DOE's nonproliferation programs still face the following management challenges in the areas of planning, budget execution, and coordination:

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<sup>7</sup>Weapons of mass destruction include biological, chemical, and nuclear weapons. Other related threats include weapons-usable nuclear materials and the scientific-industrial infrastructure for developing and producing such weapons.

- Obtaining better access to information and Russian nuclear weapons laboratories to better target program resources to the greatest risks.
- Verifying the use of program funds.
- Coordinating the several DOE programs involving the newly independent states to increase their effectiveness.

In the area of planning, setting priorities and using resources effectively are particularly critical for DOE's Material Protection, Control, and Accounting Program (nuclear materials protection program) because it is experiencing dramatically escalating costs and increases in scope. These increases are due to (1) better information on the number of buildings involved in weapons of mass destruction and better access to facilities<sup>8</sup> and (2) Russia's apparent inability to pay its share of program costs due to its poor economic situation.

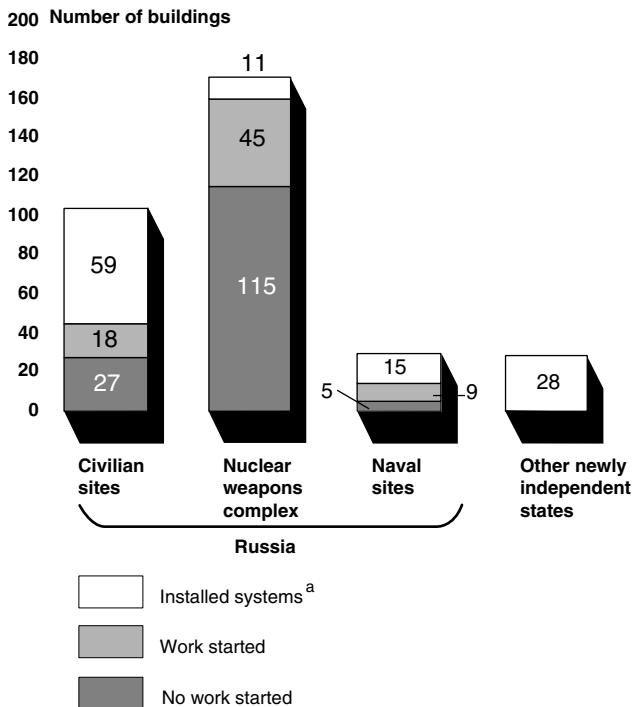
However, DOE has experienced problems in setting and following priorities. Our March 2000 report noted that, as of February 2000, DOE had completed the installation of security systems at 113 buildings in the newly independent states but that these buildings had only about 7 percent of the nuclear materials needing security upgrades. Without access to the sites and information on the materials they contain, DOE's project teams have had difficulty in planning, prioritizing, implementing, and monitoring work on security system installations. Additional information about the status of installations for nuclear materials security systems is shown in figure 1. Similarly, in its 1999 audit, DOE's Office of Inspector General reviewed nine projects and

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<sup>8</sup>DOE's initial program estimates were based on partial information available at the close of the Cold War. DOE currently estimates that 650 metric tons of weapons-grade nuclear materials are located at civilian, naval fuel, and nuclear laboratory sites in the former Soviet Union, compared with an initial estimate of 450 metric tons.

in three of the projects, identified nearly \$1 million spent on low-priority upgrades to nuclear materials protection, for which little actual reduction of risk was achieved.<sup>9</sup>

**Figure 1: Status of Nuclear Security System Installations as of February 2000**



<sup>a</sup>In Russia, buildings have either a complete physical protection system, a complete material control and accounting system, or both. Buildings at sites in the other newly independent states include both physical protection and material control and accounting systems.

<sup>9</sup>See *Nuclear Material Protection, Control, and Accounting Program*, Department of Energy (DOE/IG-0452, Sept. 16, 1999).



Source: DOE.

In response to a recommendation by DOE's Office of Inspector General, the nuclear materials protection program agreed to develop a policy on the appropriate level of access to buildings and information to determine what upgrades are needed. DOE also plans to improve review procedures for projects to help ensure that planned upgrades are consistent with program guidance. Nonetheless, identifying priorities and directing program resources to high-priority work will continue to challenge DOE's nuclear materials protection program as it addresses additional facilities and buildings, some of which are very sensitive for the Russians. Ensuring an appropriate level of access to sensitive facilities and information in Russia before committing to undertake particular projects would put DOE in a better position to target its work to the greatest risks.

To strengthen its budget execution, DOE needs to do a better job of obtaining information to verify that program funds are used as planned. For instance, DOE's Initiatives for Proliferation Prevention program provides seed money to create civilian jobs for scientists from the newly independent states who have worked on weapons of mass destruction. Yet for about 20 of the 79 cases that we reviewed for our February 1999 report, we found that the scientific institute receiving the funding did not appear to have worked on defense activities.

For several other projects, DOE did not have enough information to determine the institute's background. Some program personnel from DOE's national laboratory were reluctant to request such information because it seemed intrusive or contrary to Russia's national security laws. However, we were able to obtain background information on scientists from some of the institutes, and Russian officials told us that providing

general information about scientists' nuclear weapons-related activities did not violate Russian laws.

DOE has since improved its internal controls over the use of program funding. In response to a recommendation in our February 1999 report, DOE now requires that its officials obtain background data on scientists prior to placing contracts, to help ensure that DOE's funding is directed to those who have been involved in weapons of mass destruction. In addition, in response to our recommendations concerning the Initiatives for Proliferation Prevention Program, in September 1999, DOE issued guidance to its national laboratories requiring regular reporting on how program funds are being spent by recipients in the newly independent states. Furthermore, in the Initiatives for Proliferation Prevention Program, the Congress has capped the percentage of funding that may be used by DOE's national laboratories so that more of the program funding will be available for scientists and institutes in the newly independent states. If properly implemented, these changes will strengthen DOE's budget execution and controls for this program.

DOE's programs in the newly independent states also operate separately and have not been effectively coordinated. DOE needs to do a better job of overcoming organizational "stovepipes" among its various programs. Through recent discussions with DOE officials, we observed that DOE could better coordinate its program to increase safety at nuclear power plants (such as Chornobyl) with the nonproliferation programs to achieve the objectives of both efforts. For example, the safety program has an identified need for fire doors for nuclear power plants. Weapons technicians and engineers could be used to help design and install these fire doors. Yet the director of a DOE program to increase civilian employment for weapons scientists told us that DOE has not coordinated the efforts of these programs with the fire safety efforts for nuclear power plants. The

safety efforts are significant because, of the 59 Soviet-designed nuclear reactors currently in operation, the standards of 25 fall below Western standards for fire and/or other safety measures.

Furthermore, a 1999 report by the National Research Council recommended that DOE manage its related programs in the newly independent states as complementary efforts so that each reinforces the other.<sup>10</sup> According to the report, a Russian institute's commitment to improving nuclear materials safeguards should be an important consideration in that institute's participation in other programs. The report noted that it seems difficult to justify lucrative contracts from U.S. government sources for institutes that have poor records on safeguarding and protecting nuclear materials.

We recognize that DOE's nonproliferation programs face inherent challenges in working in Russia and the other newly independent states, including: Russia's difficult economic conditions, the need to further build on existing working relationships, and limitations on access to facilities and information. In March 2000, we concluded that the impacts of nonproliferation projects are more easily demonstrated when there are clear, mutually agreed upon national objectives; tangible threat elements; and good working relationships between U.S. and Russian officials. We noted that the impact of projects without these characteristics is generally harder to demonstrate. DOE could enhance its ability to achieve nonproliferation goals by further addressing challenges in (1) gaining access to facilities and information to improve planning, (2) obtaining information to verify the use of program funding, and

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<sup>10</sup>See *Protecting Nuclear Weapons Material in Russia*, Office of International Affairs of the National Research Council, National Academy of Sciences (1999).

(3) coordinating DOE's various programs in the former Soviet Union so that they reinforce each other's objectives.

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**Improved  
Management Tools  
and Integration  
Needed in DOE's  
Efforts to  
Clean Up  
Radioactive and  
Hazardous Wastes**

DOE faces challenges in completing the environmental cleanup of its 44 remaining sites, which includes cleaning up contaminated soil, groundwater, and surface water, as well as treating and disposing of waste.<sup>11</sup> Large volumes of radioactive and hazardous wastes have resulted from 50 years of nuclear weapons research and production activities. Many DOE cleanup projects are inherently complex. For example, the removal and treatment of highly radioactive wastes from tanks at several DOE sites requires developing and using new technologies and treating such large volumes of waste that work will take several decades. To bring such complex projects to a successful completion, DOE needs to consistently use sound management practices. However, DOE has had difficulty in completing large projects within budget and on time. Some projects have taken a decade longer than anticipated or have experienced technical failures related in part to poor management practices and DOE's inadequate oversight of contractors, costing taxpayers millions with little useful result.

In recent years, DOE has made progress in establishing project baselines, which define the scope of work, estimated costs, and schedules. The establishment of baselines has improved DOE's planning, budget execution, and management information. Significant management challenges remain, including further

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<sup>11</sup>As of the beginning of fiscal year 2000, DOE had completed active cleanups at 69 of its 113 sites, leaving 44 to be completed. Many of the sites that have completed active cleanup still require long-term care because waste remains in place or because long-term remedies, such as groundwater treatment, are still ongoing.

improving baselines and integrating activities among sites and within multipurpose sites. DOE's resolving of these issues would result in more effective use of resources by reducing duplication for waste treatment and disposal facilities and groundwater monitoring.

Beginning in fiscal year 1997, DOE required all of its cleanup sites to define their work as projects with identified start and completion points and definable scopes of work. At the same time, DOE required sites to establish baselines for all of their projects. While some sites had already followed these practices prior to the new requirements, others had conducted work on a "level-of-effort" basis, namely, working on pieces of various efforts as allowed by that year's funding. At sites that lacked defined projects and baselines, identifying completion goals and assessing interim progress toward completing cleanup work had been difficult. The use of baselines as management tools has improved DOE's planning capabilities, its control over project changes and budget execution, and the information available to its managers.

Improving cleanup planning and management through realistic and well-supported baselines warrants continued management attention. According to a July 2000 report by DOE's Office of Inspector General, while previously identified weaknesses had been corrected, problems remained as some baselines omitted or duplicated costs, and some baselines were not updated to reflect current cost estimates.<sup>12</sup> We have found that some baseline schedules were overly optimistic. For example, we reported in April 2000 that at two sites, contractors' schedules did not include enough time for obtaining regulatory approval and/or permits. DOE approved these optimistic schedules, despite past

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<sup>12</sup>See *Best Practices for Environmental Management Baseline Development*, Department of Energy (DOE/IG-0476, July 7, 2000).

experience of longer regulatory review periods and, in one case, warnings from Idaho regulators about the time needed to obtain permits to begin constructing a waste treatment facility.

Integrating waste treatment and disposal activities among sites presents unique management challenges for DOE. DOE's Office of Environmental Management has indicated that the goal of integration is to make the program more efficient, through such actions as using waste facilities' available capacity, eliminating redundant facilities, removing organizational "stovepipes," and applying site successes and lessons learned nationwide. Achieving such integration is challenging because of the geographic dispersion of DOE's cleanup sites, the large volumes of waste involved, and the differing requirements for the various types of hazardous and radioactive wastes. But integration is worth pursuing because it can result in cost savings, speedier cleanups, and improved approaches when sites share lessons learned. DOE has made progress in obtaining and analyzing the data needed to support integration. Project baselines have provided such data as (1) waste types and volumes and (2) planned schedules for sites' activities.

Significant management challenges to achieving integration among sites still exist and include (1) arranging for one site to support another's activities, as necessary; (2) providing specialized vehicles and containers for shipping waste, when and where they are needed; (3) reaching agreements with states on such issues as a state's acceptance of certain waste for treatment, storage, and/or disposal from DOE sites in other states; and (4) providing information about the costs of waste disposal options at various DOE and commercial locations so that site managers can make cost-effective decisions.

One example of an integration challenge is the need for DOE to reach agreements with states to implement its plans for consolidating wastes from several sites. In February 2000, DOE decided to dispose of certain categories of waste at the Hanford site in Washington State and the Nevada Test Site. However, as we reported in April 2000, implementing DOE's decision may be problematic because both states have raised objections to becoming the primary disposal sites for wastes from DOE sites in other states. The states could impose conditions, such as volume limits, in permits for mixed-waste facilities.

In another integration challenge noted in our April 2000 report, DOE has not had complete information on the costs of disposal options for low-level radioactive and mixed wastes.<sup>13</sup> For example, the one commercial disposal facility useful for DOE's wastes charged fees reflecting its total life-cycle costs, and four of DOE's six disposal facilities charged fees; but these fees did not capture complete costs and did not have a comparable basis. As a result, it has been difficult for site managers to consider the costs of different options in making disposal decisions. Furthermore, DOE lacked a policy about whether its waste disposal facilities should charge fees reflecting their costs and has not provided guidance for sites on how to compare costs if fees are not charged.

We recommended that DOE develop criteria and guidance for DOE's waste managers to use in making decisions about waste treatment, storage, and disposal options, including developing reasonable and consistent estimates of the life-cycle costs of DOE's disposal

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<sup>13</sup>DOE defines low-level wastes as all radioactive wastes that do not fall within other classifications, such as highly radioactive wastes and spent (used) nuclear fuel. Mixed wastes are low-level radioactive wastes with hazardous components, such as lead and mercury.

facilities. As of September 2000, DOE had not yet initiated actions in response to our recommendations. Reducing costs is important because, as our report noted, DOE plans to dispose of about 2.1 million cubic meters of these wastes over the next several decades. This volume of waste would fill an area the size of a football field stacked to nearly one and a half times the height of the Empire State Building.

DOE has also experienced difficulties in integrating environmental activities at its multipurpose sites because of organizational “stovepipes” that have resulted in a lack of comprehensive planning. For example, we reported in April 2000 that the cleanup plan of DOE’s Office of Environmental Management for the Paducah, Kentucky, site, left out billions of dollars worth of work that fell under a different DOE office. Left out of the plan were 16 unused structures, nearly 500,000 tons of depleted uranium, and nearly 1 million cubic feet of waste and scrap metal. Figure 2 shows two examples of the 148 storage areas for waste and scrap metal that were not included in the cleanup plan. In response to our recommendations, DOE officials announced in July 2000 that they would address integration issues at Paducah by developing a comprehensive plan for the site’s cleanup.



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**Major Management Challenges and  
Program Risks: Department of  
Energy**

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**Figure 2: Examples of Storage Areas for Waste and Scrap Metal That Were Left Out of Paducah's Cleanup Plan**



Source: DOE.

A review by DOE's Office of Inspector General found similar problems in integrating groundwater-monitoring activities at multipurpose sites.<sup>14</sup> At Oak Ridge in Tennessee, for instance, three DOE programs conducted separate monitoring of groundwater quality and therefore missed opportunities to economize.

DOE recognizes its integration challenges and has established an Office of Integration and Disposition to work on issues affecting multiple cleanup sites. This office is to provide such multisite services as identifying treatment and disposal options for the various waste types, operating waste transportation, and providing for the communication of lessons learned. Another mission for this office is to seek opportunities to consolidate functions among sites to reduce the duplication of functions and facilities. The integration office also develops policies for the transfer of excess contaminated facilities from other DOE programs to the Office of Environmental Management—an issue that may affect sites such as Paducah, which have ongoing missions.

The estimated total cost of DOE's cleanup and waste disposal activities—\$168 billion to \$212 billion—make improving efficiency essential. We believe that DOE needs to devote continued management attention to the improvement of project baselines and its integration challenges to achieve the desired efficiencies in its cleanup program. Reliable, up-to-date project baselines can provide DOE with better control over its cleanup work and with information that is needed to support integration activities. While DOE has begun integration initiatives, integration will continue to be a formidable task because of DOE's large volume of waste, many geographic locations, need to resolve issues with the

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<sup>14</sup>See *Groundwater Monitoring Activities at Department of Energy Facilities*, Department of Energy (DOE/IG-0461, Feb. 22, 2000).

states, and history of organizational “stovepipes” among its programs and locations.

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**Problems in  
Contract  
Management Place  
It at High Risk for  
Fraud, Waste,  
Abuse, and  
Mismanagement**

Since 1990, we have designated contract management at DOE as a high-risk area, and we continue to consider it high risk. DOE, the largest civilian contracting agency in the federal government, primarily relies on contractors to operate its facilities and carry out its missions. DOE uses contractors to manage a wide variety of activities, including performing research, maintaining the nuclear weapons stockpile, and cleaning up radioactive and hazardous wastes. To carry out these missions, DOE’s contracts often involve the design, construction, and operation of multi-million-dollar, one-of-a-kind facilities. In fiscal year 1999, DOE obligated about \$15.5 billion, or about 90 percent of its total obligations, to contracts.

For years, we and others have reported on problems with DOE’s contract management, which we have defined broadly to include contract administration and project management. These problems have included noncompetitive awards, cost and schedule overruns, inadequate oversight of contractors’ activities, an over-reliance on cost-reimbursement contracts, and an inability to hold contractors accountable. Because it relies on contractors to carry out its missions, failing to address these problems could limit DOE’s effectiveness and efficiency in its stockpile stewardship, security, cleanup, and other missions.

DOE is aware of its contract management problems and has numerous initiatives under way to address them. While progress is being made to correct the problems, many of these initiatives will take a number of years to fully implement. Furthermore, since DOE uses contractors to manage many aspects of its missions, initiatives to improve contract management need to be directed at the underlying culture of the organization.

Therefore, DOE will need to continue focusing management attention on these problems for the long term to effect lasting change for both DOE and contractor staff.

For example, DOE created a new office in November 1999 to implement policies and procedures to improve project management and oversight. Efforts are also under way to improve up-front acquisition planning, to help ensure that the appropriate contracting and financing approach is used on major projects, and to better integrate contract and project management. However, these initiatives are in the early stages, and it is too soon to tell whether they will be effective in preventing cost and schedule overruns and in holding contractors fully accountable. Cost and schedule overruns have plagued DOE's projects over the years, and they continue to persist, as shown in the following examples:

- The National Ignition Facility, being built at the Lawrence Livermore National Laboratory to evaluate the behavior of nuclear weapons without explosive testing, was originally expected to cost about \$2.1 billion and be completed in 2002. DOE now estimates that this facility will eventually cost about \$3.5 billion and be completed in 2008—over a \$1 billion dollar increase in cost and 6 years later than originally estimated. As we reported in August 2000, these cost increases and schedule delays have been attributed to a combination of poor contractor management and inadequate DOE oversight, including inadequate technical and managerial skills to oversee the project. We recommended that DOE arrange for an outside scientific and technical review of the facility's remaining technical challenges related to its cost and schedule risks.
- At DOE's Savannah River Site, the in-tank precipitation process was selected in 1983 as the preferred method for separating highly radioactive

wastes from 34 million gallons of liquids in storage tanks. In 1985, DOE estimated that it would take about 3 years and \$32 million to construct the in-tank precipitation facility. In April 1999, we reported that after a decade of delays and spending almost \$500 million, DOE suspended the project because it would not work safely and efficiently as designed. Among the factors contributing to this failure were the ineffectiveness of the contractor's management and of DOE's oversight of the project. Problems in management may have continued in DOE's efforts to find an alternative method for waste separation. According to a 2000 report by a committee of the National Research Council, the committee did not see a strong and technically informed management in place at the Savannah River Site. Furthermore, the committee noted that it became increasingly difficult to determine who was in charge of managing the program over the course of the committee's study.<sup>15</sup>

In another example, DOE's Office of Environmental Management started its privatization initiative in 1995 to reduce the cost of, and speed the cleanup of, its contaminated sites and to improve the contractors' performance. For large cleanup projects, this was primarily an alternative contracting and financing strategy that emphasized fixed-price contracts and full private financing. We reported in June 2000 that while fixed price contracting had been successful for some projects with a known scope, privatization has generally not accomplished DOE's goals for complex cleanup projects.

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<sup>15</sup>See *Alternatives for High-Level Waste Salt Processing at the Savannah River Site*, Committee on Cesium Processing Alternatives for High-Level Waste at the Savannah River Site, National Research Council (2000). The National Research Council, as the principal operating agency of the National Academy of Sciences and the National Academy of Engineering, provides the government, public, and scientific and engineering communities with services and research.

For example, DOE chose the privatization approach for the Tank Waste Project at the Hanford site. The project involved treating about 5 million gallons of highly radioactive wastes stored in underground tanks. The contract to design, build, and operate the facility to treat the wastes had an estimated price of \$6.9 billion. In April 2000, the contractor submitted a revised price estimate of over \$15 billion. DOE terminated the privatized contract because it was concerned about the contractor's performance and the rapidly escalating cost estimates, as well as the full private financing approach chosen by DOE. In October 1998, we concluded that DOE should reassess the cost-effectiveness of its proposed approach to the project, including contracting and financing alternatives to the privatized approach. On the basis of DOE's assessment of the alternatives, the Department has recompeted the project under a more traditional cost-reimbursement-plus-incentive-fee approach.

In 1993, DOE established a Contract Reform Team and in 1994 began implementing numerous initiatives to improve contract management. These initiatives include increasing competition and switching to performance-based contracts. For example, DOE revised its procurement regulations to make competition the normal practice and, overall, has increased its use of competition in awarding contracts. As of September 2000, 68 percent of DOE's major contracts were awarded competitively compared with only 9 percent of its major contracts in 1990. However, some of DOE's larger contracts for operating its national laboratories, including ones that have a history of security and/or project management problems, continue to be extended rather than competed.<sup>16</sup> Deciding to extend rather than compete these contracts may weaken DOE's negotiating position to use contracts to effect changes that relate to such problem areas as security and project management.

In another example, DOE revised its procurement regulations to shift to performance-based contracts and to hold its contractors more accountable. In April 1999, DOE implemented a new fee policy that would put a contractor's entire incentive fee at risk for poor performance in environment, safety, and health areas. DOE also has initiatives to improve the performance incentives for contractors to align them more closely with DOE's strategic goals for a site. As of September 2000, DOE officials told us that all of their major contracts to manage and operate the Department's facilities are now performance-based contracts.

While performance incentives can better focus contractors' efforts in doing the work most crucial to achieving DOE's missions, the performance incentives are not always clearly linked to DOE's objectives nor structured to focus on outcomes to be achieved and, thus, may not accomplish the desired results. For example, in April 2000, DOE's Office of Inspector General reported that the performance-based incentives at the Idaho National Engineering and Environmental Laboratory had not been fully successful in improving performance and reducing costs. Because of problems with structuring incentives to reward outcome rather than process and with validating the contractor's performance, the Office of Inspector General questioned \$11.3 million in incentive fees paid to the contractor.<sup>17</sup>

Our May 1999 report on the use of performance-based contracting at DOE's national laboratories indicated that

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<sup>16</sup>DOE's national laboratories are designated as federally funded research and development centers and are not subject to full and open competitive procedures for their establishment or maintenance. Nevertheless, DOE has competed the contracts for some of its current centers.

<sup>17</sup>See *Performance Incentives at the Idaho National Engineering and Environmental Laboratory*, Department of Energy (WR-B-00-05, Apr. 3, 2000).

DOE did not know if this form of contracting was achieving the intended results of improved performance and lower costs. We recommended that DOE evaluate the costs and benefits from using such contracts at its national laboratories. In April 1999, we reported that one of the factors contributing to DOE's security problems at the national laboratories was the lack of emphasis given to security matters in the contractor's performance incentives. For example, two of the contracts lacked performance incentives for counterintelligence activities, and the performance incentive for safeguarding classified documents and materials accounted for less than 1 percent in the contractor's performance evaluation.

Over the long term, DOE may resolve all of the problems in its contract management. Until then, DOE's ongoing problems can increase the government's costs and expose DOE to billions of dollars of financial risk.

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## **DOE's Financial Management Could Be Improved**

DOE's Office of Inspector General reported certain concerns related to financial management in its audit of DOE's consolidated financial statements for the fiscal year ending on September 30, 1999.<sup>18</sup> First, in November 1998, DOE's Western Area Power Administration (which markets and transmits electricity from multiuse water projects) implemented a new financial management system that has been unable to generate financial statements. As a result, DOE's Office of Inspector General reported this as a material weakness. The Western Area Power Administration had developed a corrective action plan, and the Office of Inspector General recommended that DOE's Chief Financial Officer monitor the plan's implementation. However, in

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<sup>18</sup>See *The U.S. Department of Energy's Consolidated Financial Statements for Fiscal Years 1999 and 1998*, Department of Energy (DOE/IG-FS-00-01, Feb. 17, 2000).



November 2000, DOE's Office of Inspector General reported that the Western Area Power Administration was still experiencing delays in the preparations of its fiscal year 1999 financial information for audit.<sup>19</sup> The report noted that these delays could also affect the Inspector General's audit of DOE's fiscal year 2000 consolidated financial statements.

Second, DOE's Office of Inspector General cited a reportable condition related to the estimation process for environmental liabilities. DOE used modeling to estimate the majority of the \$25 billion environmental liability for contaminated active and surplus facilities—a portion of the \$230 billion total estimated environmental liability. This portion of the liability estimate reflects facilities managed by ongoing programs that have not yet been transferred to DOE's Office of Environmental Management but will ultimately require remediation.

The data used for these models were found to be unreliable. Of the 85 facilities selected for review by the Office of Inspector General, errors were found in the data for 14 facilities, resulting in a 16-percent error rate. These errors included incorrect facility model types, the inclusion of facilities that were not contaminated, the exclusion of facilities that were contaminated, and material errors in the square footage of the facilities. These errors occurred because facility managers responsible for maintaining the facilities at some of the 14 sites were not directly involved in the data's verification. The Office of Inspector General recommended that DOE's Chief Financial Officer develop procedures for verifying data about the facilities, which DOE management agreed to implement.

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<sup>19</sup>See *Management Challenges at the Department of Energy*, Department of Energy (DOE/IG-0491, Nov. 28, 2000).

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**Major Management Challenges and  
Program Risks: Department of  
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# Related GAO Products

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## Maintaining Nuclear Weapons Capabilities

*Nuclear Weapons: Management Improvements Needed to Effectively Implement the Stockpile Stewardship Program* (GAO-01-48, Dec. 14, 2000).

*National Ignition Facility: Management and Oversight Failures Caused Major Cost Overruns and Schedule Delays* (GAO/RCED-00-271, Aug. 8, 2000).

*Nuclear Weapons: Challenges Remain for Successful Implementation of DOE's Tritium Supply Decision* (GAO/RCED-00-24, Jan. 28, 2000).

*Nuclear Weapons: DOE Needs to Improve Oversight of the \$5 Billion Strategic Computing Initiative* (GAO/RCED-99-195, June 28, 1999).

*Nuclear Weapons: Key Nuclear Weapons Component Issues Are Unresolved* (GAO/RCED-99-1, Nov. 9, 1998).

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## Correcting Security Weaknesses

*Nuclear Security: Information on DOE's Requirements for Protecting and Controlling Classified Documents* (GAO/T-RCED-00-247, July 11, 2000).

*Department of Energy: National Security Controls Over Contractors Traveling to Foreign Countries Need Strengthening* (GAO/RCED-00-140, June 26, 2000).

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*Nuclear Security: Security Issues at DOE and Its Newly Created National Nuclear Security Administration* (GAO/T-RCED-00-123, Mar. 14, 2000).

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*Department of Energy: Views on DOE's Plan to Establish the National Nuclear Security Administration* (GAO/T-RCED-00-113, Mar. 2, 2000).

*Nuclear Security: Improvements Needed in DOE's Safeguards and Security Oversight* (GAO/RCED-00-62, Feb. 24, 2000).

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**Cleaning Up  
Radioactive Wastes**

*Department of Energy: Uncertainties and Management Problems Have Hindered Cleanup at Two Nuclear Waste Sites* (GAO/T-RCED-00-248, July 12, 2000).

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